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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/808,315	02/28/1997	HIROYUKI KINOSHITA	247/PD-5385	6175

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EXAMINER	
MENEFEE, JAMES A	

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	08/808,315	KINOSHITA ET AL.	
	Examiner	Art Unit	
	James A. Menefee	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

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Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

In response to the amendment filed 2/13/2004, claim 20 is amended and claims 23-25 added. Claims 20-25 are pending.

Claim Rejections - 35 USC § 103

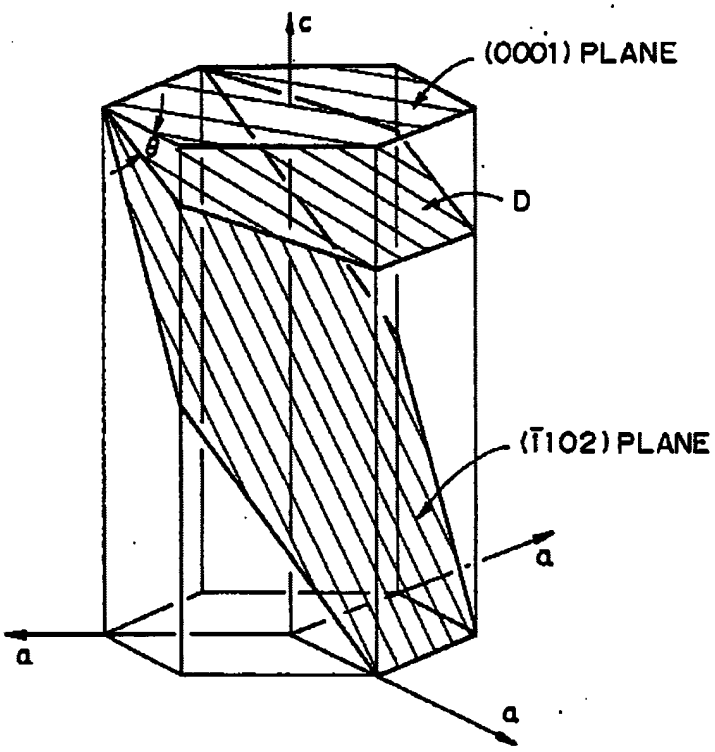
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoi et al. (previously cited US 4,908,074) in view of Yamazaki et al. (previously cited as Setsune, JP 61121042), and further in view of Iwasaki et al. (previously cited US 5,549,978).

Regarding claim 20, Hosoi discloses a sapphire monocrystal plate comprising a sapphire monocrystal having a major face, wherein the major face is a plane A or a plane C of the sapphire monocrystal (see Fig. 3 marked up below and discussion thereof, and col. 6 lines 55-66). It is not disclosed that there is a working reference plane on a peripheral edge of the plate that is substantially perpendicular or parallel to a plane R of the sapphire monocrystal. Setsune teaches that it is known to cleave an R plane of a sapphire monocrystal. It would have been obvious to one skilled in the art to cleave a sapphire monocrystal, such as that found in Hosoi Fig. 3, along the R plane as in Setsune, in order to form certain devices that require such a cleaving, such as Setsune's optical switch, as taught by Setsune. After such an obvious cleavage

of the R plane, the edge of the plate will be the R plane, and will be a working reference plane on the peripheral edge of the plate.



Hosoi, Fig. 3

It is further not disclosed that the major surface, i.e. the C plane of Hosoi Fig. 3, has a surface roughness of less than 0.1 microns. Iwasaki discloses that a C plane of a sapphire crystal may be polished to a surface roughness less than 0.1 microns (col. 24 lines 45-51). It would have been obvious to one skilled in the art to do this so that the plane may be a mirror surface, as taught by Iwasaki. There are numerous applications known in the art where a plane of a sapphire crystal is formed as a mirror.

It is not disclosed that the plate of Hosoi is "for epitaxially growing a semiconductor layer thereon." This limitation details only the intended use of the device, and thus is not given

patentable weight. Note that in new claim 23, which does positively recite a semiconductor layer, this limitation is given weight. See the rejection below.

Regarding claim 21, the working reference plane is the R plane, and thus the angle therebetween is 0 degrees.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosoi and Setsune and Iwaskai as applied to claims 20-21 above, and further in view of Nitta et al. (previously cited US 5,403,773). The limitations of claims 20-21 are taught as above, but there is not disclosed a microcrack line on the major face parallel to the plane R for starting to cleave the plate. Nitta teaches that a wafer is scribed along cleavage lines (col. 3 lines 37-43). This scribing will inherently form a microcrack, as scribing by definition entails scratching a wafer to form a crack. Since it was shown above to be obvious to cleave along the R plane, then the microcrack formed by such scribing will necessarily be parallel to the R plane. It would have been obvious to one skilled in the art to scribe the device in order to perform the cleaving process, as taught by Nitta.

Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiyama et al. (US 5,787,104) in view of Yamazaki and further in view of Iwasaki. Kamiyama discloses in Fig. 35 a semiconductor laser diode comprising a substrate formed of a sapphire monocrystal, the substrate having a major face and a side face, the semiconductor laser being formed on the major face. It is disclosed that the laser is formed on the c plane of the sapphire substrate. It is not disclosed that the peripheral edge of the plate is parallel to an R plane of the sapphire.

Kamiyama does disclose that the sapphire body has a R plane. Yamazaki teaches that it is known for a cleavage plane of a sapphire body to be the R plane. It would have been obvious to one skilled in the art to make the R plane the cleavage plane as this is a manner of producing side faces of a sapphire substrate, as taught by Yamazaki. This forms the working reference plane as the R plane, thus the angle between them is about 0 degrees, falling within the claimed range.

It is further not disclosed that the major surface has a surface roughness of less than 0.1 microns. Iwasaki teaches this limitation with motivation as in the above rejection of claim 20.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiyama and Yamazaki and Iwaskai as applied to claims 23-24 above, and further in view of Nitta. The limitations of claims 23-24 are taught as above, but there is not disclosed a microcrack line on the major face parallel to the plane R for starting to cleave the plate. Nitta teaches this limitation with motivation as in the above rejection of claim 22.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are not persuasive.

Applicant argues that Hosoi does not meet the claimed invention because a semiconductor layer cannot be grown on the plane c shown in Hosoi. This is not persuasive, because the intended use of the device, for epitaxially growing a semiconductor layer thereon, is not given patentable weight. If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or

intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999). See also Rowe v. Dror, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997) ("where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation"). Note that the limitation is given weight in claim 23, as it is positively recited in the body of the claim that there is a semiconductor layer, but this claim is rejected using a different reference.

Applicant further argues that Iwasaki cannot be used to combine because the process of smoothing in Iwasaki is different than the process in the present invention. This is not persuasive. Firstly, the particular process used by the applicant for smoothing is not claimed, and thus is not given weight. Secondly, even if the process of smoothing were claimed in the present claims, it would not be given patentable weight. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). The limitation given weight is the surface roughness, not the process for achieving that roughness.

Applicant argues further that Iwasaki is only combined with the other references by using impermissible hindsight. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any

judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The knowledge taught by Iwasaki is within the level of ordinary skill in the art.

The Examiner reiterates the argument in his previous Office Action: The applicant is claiming nothing more than a sapphire body having a face that is a C or A plane and an edge that is an R plane or parallel to an R plane, where the C or A plane has the specified roughness. All sapphire crystals will, by definition, include C, A, and R planes. It is shown herein that the faces and edges of a sapphire crystal may be as claimed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (571) 272-1941. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JM
March 4, 2004

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